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strides in a 3-D aqueous fate and transport model

ALGE is a 3-D aqueous model capable of simulating thermal and contaminant transport, including the fate of dissolved and particulate materials, along with suspended sediment. The model has been applied to quantifying cooling dissipation and providing consequence assessment for accidental releases of chemicals and radionuclides in complex ecosystems. The ALGE model is currently prepopulated for a variety of rivers, lakes, bays, and coastal estuaries across the continental United States. However, ALGE can be utilized globally for any coastal or inland body of water. New applications of ALGE include investigating anthropogenic runoff to ascertain the impact of urban heat islands in evolving ecosystems due to urbanization, and understanding how microplastics are transforming the environment across multiple scales. Coupling with hydrodynamic models, such as the Army Corps of engineers Hydrologic Modeling System (HEC-HMS), incorporates runoff and watershed estimates due to rainfall as source inputs. Other recent developments include the addition of physical processes such as coagulation of breakup and sediment, allowing for proper characterization of particulate contaminants that flow downstream. These developments illustrate the broad applications for ALGE as a robust tool for assessing emissions and pathways with relevant linkages to the nuclear fuel cycle.

E-mail

vivian.turner@srnl.doe.gov

In-person or online preference

Primary author: TURNER, Vivian (Savannah River National Laboratory)

Presenter: TURNER, Vivian (Savannah River National Laboratory)

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